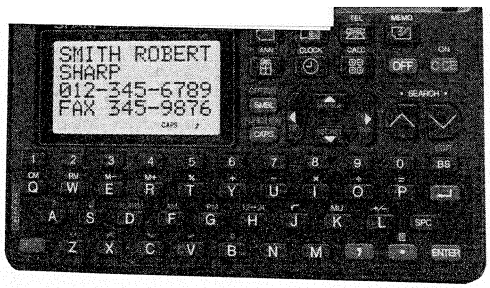
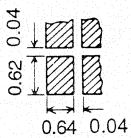
SHARP SERVICE MANUAL

CODE: 00ZZQ2250SM/E

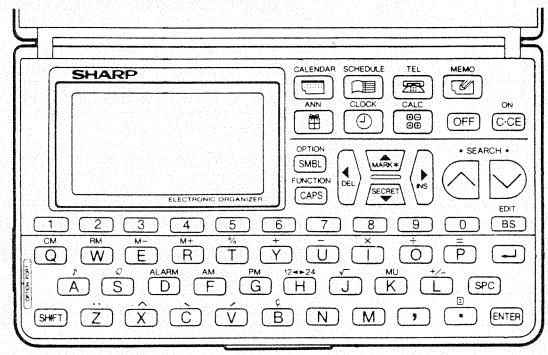


ZQ-2000
MODEL ZQ-2200, ZQ-2250

(ZQ-2000)

	STANDARD FUNCTION	10 digits 1 M	
DISPLAY SECTION	ELEMENT: FEM LCD	PARTS NAME: LF7644G	
	NUMERAL: 12 digits (4 lines)		
	 (mm)	72 x 32 dot matrix liquid crystal display 12 columns x 4 lines (with 6 x 8 dot characters)	

KEY LAYOUT



KEY SYSTEM: Rubber key

LSI	CPU: LI3505F (172pin-FILM) SRAM: • ZQ-2000 LH5164MN (28pin-SOP) • ZQ-2200/2250 D43256AGU (28pin-SOP)		
	POWER SUPPLY: AC: X DC: ○		
	Main power supply: 6 VDC lithium batteries (CR2032 x 2) Memory backup power: 3 VDC lithium battery (CR2032 x 1)		
	AC ADAPTOR: —		
	RECHARGEABLE BATTERY: —		
	POWER CONSUMPTION: 0.02 W		
	AUTO POWER OFF TIME: Approx. 7 minutes		
	MEMORY PROTECT: Yes		
	DIMENSIONS(mm): Open: 145(W) x 165.5(D) x 9(H) mm. Closed: 145(W) x 82(D) x 13(H) mm.		
	Weight: Approx. 125g (including batteries)		
	CALCULATIONS: addition, subtraction, multiplication, division; constant, square root, percent, memory calculation, etc.		
	Accessories: Lithium batteries (CR2032 x 3) Operation manual		

Electronic notebook section

Telephone directory mode	Entry and recall of names, phone numbers, and addresses
Schedule mode	Entry and recall of dates, appointment times, and details of appointments Automatic day-forward function, schedule alarm function
Calendar mode	Display of calendars for Jan., 1901 to Dec., 2099 Schedule mark function distinguishing between morning and afternoon appointments
Memo mode	Entry and recall of everyday memos
Anniversary mode	Entry and recall of anniversary dates and details of anniversaries
Memory capacity	ZQ-2000 16K bytes (User area: Approx. 14.8K bytes) Schedule mode capacity: Approx. 240 items, each consisting of up to 32 characters Telephone directory mode capacity: Approx. 390 items, each consisting of 16 characters for name entry and 12 for number entry ZQ-2200/2250 32K bytes (User area: Approx. 30.8K bytes) Schedule mode capacity: Approx. 510 items, each consisting of up to 32 characters Telephone directory mode capacity: Approx. 820 items, each consisting of 16 characters for name entry and 12 for number entry These capacities only apply when all the available memory has been committed to a single function.
Maximum character string length per data	Maximum 512 characters (Telephone directory, details of schedules, anniversaries and memo)
Other features	Secret function, data transfer

Clock

Crystal oscillation frequency	32,768 Hz
Clock precision	Average variance ±30 seconds per month (at 25°C/77°F)
Content of displays	year, month, day, day of week, hours, minutes, A.M./P.M.
Time system	12-hour and 24-hour clock

Operating time

- Approx. 650 hours
  When data is continuously displayed at an ambient temperature of 20°C (68°F).
- Approx. 500 hours
  When data is searched for 5 minutes per hour, and the data is displayed for 55 minutes per hour, at an ambient temperature of 20°C (68°F).
- When off, and the clock is running, operating time: Approx. 1 year
- Memory backup battery life:
  Approx. 5 years (if operating batteries are replaced promptly when exhausted)
  Approx. 3 years (if operating batteries are exhausted or not installed)

SHARP CORPORATION

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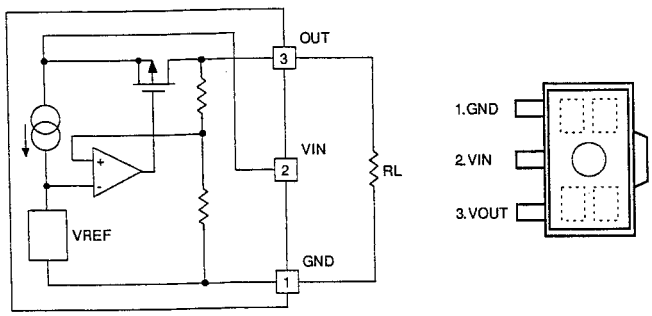
The contents are subject to change without notice.

1. CPU (LI3505F) terminal description

Signal name	Input/Output	Descriptions
S74	Output	Liquid crystal drive segment output.
S73	Output	Liquid crystal drive segment output.
H32	Output	1/32 duty liquid crystal drive common output.
〃	〃	〃
H17	Output	1/32 duty liquid crystal drive common output.
S72	Output	Liquid crystal drive segment output.
〃	〃	〃
S1	Output	Liquid crystal drive segment output.
H1	Output	1/32 duty liquid crystal drive common output.
〃	〃	〃
H16	Output	1/32 duty liquid crystal drive common output.
TEST	Input	Test pin (V_{CC}). Fix to the high level.
VCC	—	Main power source pin
VB	Output	Liquid crystal drive power output divided by the built-in bleeder resistor.
VM	Output	Liquid crystal drive power output divided by the built-in bleeder resistor.
VA	Output	Liquid crystal drive power output divided by the built-in breeder resistor.
VH	Output	Power output from VCC through the built-in contrast adjusting resistor, and the maximum voltage which is applied to the liquid crystal.
VD	—	Crystal oscillator power pin. A voltage which is externally dropped to 3V (TYP.) is supplied.
GND	—	Power. (Two GND pins are connected together inside the chip.)
XI	—	Crystal oscillator pin. By attaching a crystal oscillator and GND capacitor, an oscillation circuit is composed.
XO	—	Crystal oscillator pin. By attaching a crystal oscillator and GND capacitor, an oscillation circuit is composed.
RST	Input	Reset input. Low active input to reset LSI.
GND	—	Power. (Two GND pins are connected together inside the chip.)
KI7	Input	Input for communication between sets. High active input pin including a pull-down resistor (TYP 250kΩ).
EO2	Output	Used for output for communication between sets.
KI8	Input	Low active input used for voltage detection. Only when reading signals, the pull-up resistor is turned on.
EO3/BZ1	Output	Outputs the buzzer signal (4KHz).
EO1	Output	Used to control the voltage detection IC.
AD1	Output	Address output for external RAM.
〃	〃	〃
AD15	Output	Address output for external RAM.
R/W	Output	Outputs the read/write signal for controlling external RAM. When reading, a high level signal is supplied, and when writing, a low level signal is supplied.
CE1	Output	Outputs the chip enable signal for controlling external RAM. Either CE1 or CE2 becomes low according to the address. therefore, two static RAM's can be connected.
CE2	Output	Outputs the chip enable signal for controlling external RAM. Either CE1 or CE2 becomes low according to the address. therefore, two static RAM's can be connected.
DIO1	Input/Output	Data I/O for external RAM.
〃	〃	〃
DIO8	Input/Output	Data I/O for external RAM.
KI1	Input	Low active input for ON key only. Key matrix is composed of this pin and GND. Only when reading the key, the pull-up resistor is turned on.
KI2	Input	Low active input pin which composes the key matrix with strobe output. Only when reading the key, the pull-up resistor is turned on.
〃	〃	〃
KI6	Input	Low active input pin which composes the key matrix with strobe output. Only when reading the key, the pull-up resistor is turned on.
STB15	Output	Strobe output. Low active output pin which forms the key matrix with the key input.
〃	〃	〃
STB0	Output	Strobe output. Low active output pin which forms the key matrix with the key input.

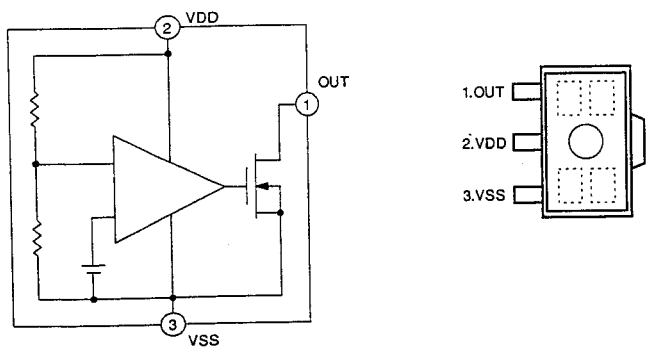
2. Regulator

(Internal block diagram)



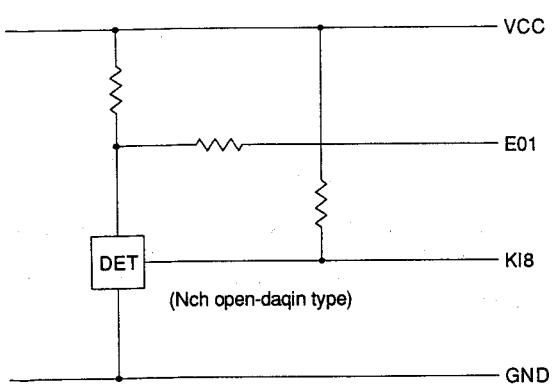
3. Detector

(Internal block diagram)



4. Low voltage detection method

- In this model, a warning is given only to the main battery exhaustion, not given to the backup battery exhaustion.
  The main battery exhaustion is detected in the circuit shown below:



1) Caution level (detection voltage: About 4.8 ~ 5.3V)

- When the caution level is detected while displaying, the low battery symbol (BATT) is lighted.
- When the caution level is detected on supplying the power to the set or on pressing the reset switch, the battery replacement indication (PLEASE REPLACE THE OPERATING BATTERY !) is displayed for about 4 sec.
- When the caution level is detected while sounding the alarm or key input sound, the alarm sound or key input sound is stopped.

2) Fatal level (Detection voltage: About 4.4 ~ 4.8V)

- When the fatal level is detected while displaying, the whole system is turned off.
- When the fatal level is detected, on supplying the power to the set or on pressing the reset switch, the whole system is turned off.
- When the fatal level is detected while sounding the alarm sound or key input sound, the alarm sound or key input sound is immediately stopped. After 100ms, the voltage is restored and the next process is performed.
- When the fatal level is detected while the power is off, pressing the ON key will not supply power to the set. The reset key is also disabled. (Until the battery is replaced.)

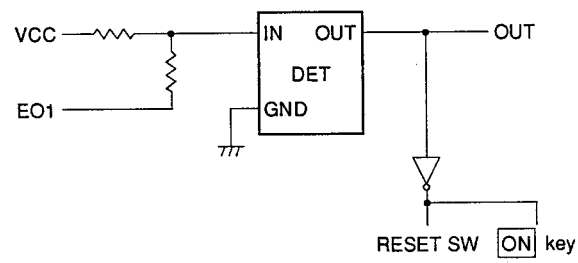
[Note] Since low voltage detection is not performed for the memory protection battery, please note the battery replacement label and replace when necessary.

5. Alphabet: Caps/Low

- Caps/Low of alphabet can be selected by pressing the CAPS key.
- When the power is supplied by pressing the ON key, Caps is selected. (Caps symbol is lighted.)

● Circuit

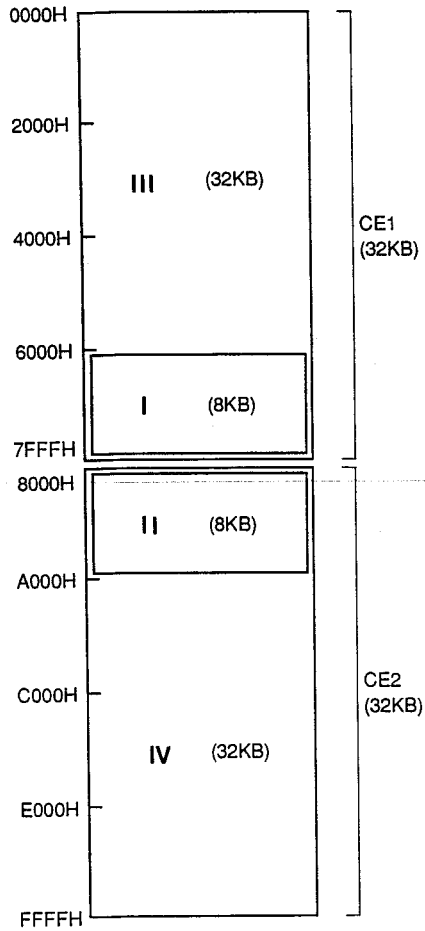
- This circuit has no hysteresis characteristics.



● Software

1. Caution level is detected every 0.5sec. (EO1 = GND)
2. In normal cases, only the fatal level is detected. (EO1 = Vcc)
3. Even when the system is off, the fatal level is detected.

6. Memory map



- PLA is selected so that CE1 is outputted to the former half space of 32KB and CE2 is outputted to the latter half of 32KB. (CE1, CE2: The chip enable output for addressing the external memory)
- Either when one 8KB RAM is used or when two 8KB RAM's are used, the former half RAM address is assigned to 6000H level. This allows continuous assignment of addresses when two RAM's are used.

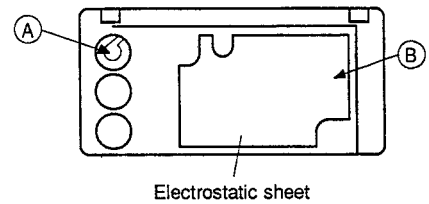
	RAM capacity as a set	Memory type (D7H)
	8KB (I only)	2
ZQ-2000 →	16KB (I + II)	3
ZQ-2200/2250 →	32KB (III only)	4
	64KB (III + IV)	5
	(In case of error)	0

7. Conduction test

Ⓐ = Backup battery ⊖ terminal
Ⓑ = Electrostatic sheet (Plain serface)

- Check conduction between Ⓐ and Ⓑ.

Max. 10 Ω



8. Current check

(VBAT1 = 6.0V)

1. Press the OFF key.
2. Measure the current value. (After 1 sec.)
   When OFF: 15μA or less
3. Press the ON key.
4. Measure the current value.
   When ON: 200μA or less

9. Note for Battery replacement

Replacing batteries

Batteries used in the Organizer:

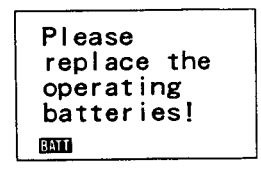
Type	Model	Qty.	Use
Lithium battery	CR2032	2	Unit operation
Lithium battery	CR2032	1	Memory backup

The standard built-in clock is powered by the operating batteries.

Precautions when replacing the batteries

Before replacing the battery, be sure to press [OFF] to turn the power off.

Do not replace the memory backup battery when the operating batteries are depleted. When the operating batteries become weak and you turn the power on, " BATT " will be displayed and the following display will appear temporarily:



If the batteries become weaker (the alarm or the key beep does not sound), the power may go off during operation or the Organizer may fail to turn on.

The memory contents will still be retained by the memory backup battery. Replace the operating batteries to avoid loss or alteration of data.

Before removing the batteries for replacement, record important information on paper.

Precautions on battery use

Always replace both operating batteries at the same time.
Do not use an old battery and a new one together.
Use only the specified lithium batteries.
Replace the memory backup battery at least every 5 years.
The original batteries were installed in the factory at the time of shipment and might be depleted before satisfying the operating time indicated in the specifications.

Battery precautions

- Keep the batteries out of the reach of children.
- When batteries become weak, remove them from the Organizer immediately. If depleted batteries are left in the Organizer for any length of time, they might leak and cause corrosion inside the Organizer.
- Do not dispose of batteries by fire as they may explode.

Operating batteries

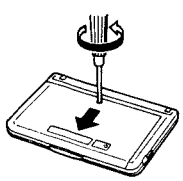
Replacement intervals for the power source batteries

When " BATT " is displayed and the LCD becomes too dim to read despite contrast adjustment, the operating batteries are depleted. Press [OFF] to turn the power off and then turn the power back on. If the following display appears when the power is turned on, replace both operating batteries immediately.

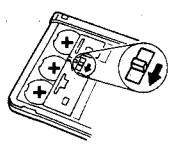
```
Please
replace the
operating
batteries!
BATT
```

Replacing the operating batteries

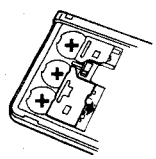
1. Press [OFF] to turn the power off.
2. Loosen the screw and remove the back cover. (Fig. 1)
3. Set the battery replacement switch to "Replace OPERATING batteries". (Fig. 2)
4. Slide the battery cover. (Fig. 3)
5. Remove the used batteries by prying them out with a ball-point pen. (Fig. 4)
   Do not use a mechanical pencil or sharp pointed object. This may cause damage to the mechanical pencil or the Organizer.
6. Install 2 new batteries with the (+) sides facing up. (Fig. 5)
7. Replace the battery cover and set the battery replacement switch to "Normal Operation". (Fig. 6)
   Caution: If the battery replacement switch is not returned to "Normal Operation", the Organizer will not function properly. Make sure that the switch is in the correct position.
8. Replace the back cover and screw. (Fig. 7)
9. Press the RESET switch.
   If the power is not turned on or a meaningless display appears, repeat the above battery replacement procedure.
10. Set the clock. (Refer to "Setting the clock".)



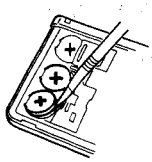
(Fig. 1)



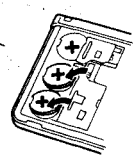
(Fig. 2)



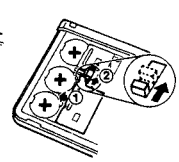
(Fig. 3)



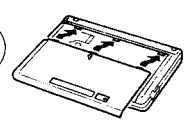
(Fig. 4)



(Fig. 5)



(Fig. 6)



(Fig. 7)

Memory backup battery

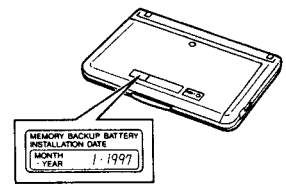
The life of the memory backup battery

The memory backup battery in your Organizer has an effective life of about 5 years under normal operating conditions. Note that temperature extremes can shorten the battery life and cause memory losses.

- Replace the memory backup battery every 5 years.

When you replace the battery, write down the date on the label of the Organizer so you know when to replace the battery next time.

For example, if you replace the battery in January, 1997, write:

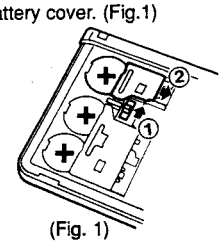


Note: Extremes of temperature will shorten battery life and endanger the memory information.

Replacing the memory backup battery

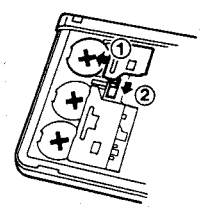
When replacing the memory backup battery, make sure that the operating batteries are not depleted. If the operating batteries are depleted, replace these before replacing the memory backup battery. If you replace the memory backup battery while the operating batteries are depleted, all of the data in the memory will be lost.

1. Press [OFF] to turn the power off.
2. Loosen the screw and remove the back cover.
3. Set the battery replacement switch to "Replace MEMORY backup battery" and slide the battery cover. (Fig.1)



(Fig. 1)

4. Remove the used battery by prying it out with a ball-point pen.
   Do not use a mechanical pencil or sharp pointed object. This may cause damage to the mechanical pencil or the Organizer.
5. Install the new battery with the (+) side facing up.
6. Replace the battery cover and set the battery replacement switch to "Normal Operation". (Fig.2)



(Fig. 2)

Caution: If the battery replacement switch is not returned to "Normal Operation", the Organizer will not function properly. Make sure that the switch is in the correct position.

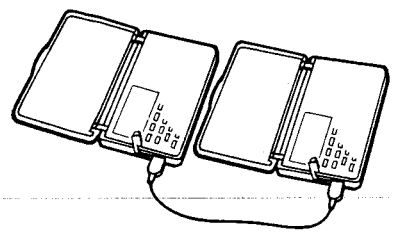
7. Replace the back cover and screw.

10. Using the data transfer function

This Organizer can transmit data to and receive data from the following products.

1. Data transfer between ZQ-2000/2200/2250 Organizers (using option CE-200L or CE-300L).
2. Data transfer with a ZQ-5000 or IQ series Organizer (using option CE-200L or CE-300L).
3. Data transfer with an EL series Organizer (including Auto Dialer) that has data transfer capability (using option CE-220T).

Before establishing communication between products, turn the products off and connect the cable.



Notes:

- To interrupt data transfer, press [C·CE] .
- If a connector is disconnected, or a similar problem occurs during data transfer, the message "I/O DEVICE ERROR" will appear.
- After data transfer, the data on the transmitter is preserved.

10-1. Transferring data between ZQ-2000/ZQ-2200/2250 Organizers

Telephone directory data, schedule data, and memo data can be transferred. Data can be transferred and verified by mode (all items in the SCHEDULE mode, MEMO mode, or a telephone directory – TEL1, TEL2, TEL3) or by data item. In addition, data can be backed up using Organizers of the same type.

Transferring data by mode and by data item

Schedule data are transferred by mode. During mode transfer, data previously stored in the specified mode of the receiver are deleted. Proceed with caution.

Note: When mode transfer is carried out in the telephone directory mode, all listings in the directory will be transferred. (In this case, the directory name is transferred at the same time.)

1. Select the mode on the transmitter and receiver.

   [SCHEDULE] [C·CE] (Transmitter)

   [SCHEDULE] (Receiver)

2. Select the data transfer function on the receiver.

   [SHIFT] [OPTION]

   ```
   UNIT TO UNIT
   1 SEND
   2 RECEIVE
   3 VERIFY
   ```

3. Set the receiver in the receive mode.

   2

   ```
   UNIT TO UNIT

   RECEIVING
   MODE
   ```

4. Select the data transfer function on the transmitter.

   [SHIFT] [OPTION]

   ```
   UNIT TO UNIT
   1 SEND
   2 RECEIVE
   3 VERIFY
   ```

   Note: When transferring by data item, display the desired data and press [SHIFT] [OPTION] .

5. Perform data transfer.

   1

Notes:

- If the mode of the transmitter and the mode of the receiver are not the same, data transfer is not established. The message "DATA ERROR" is displayed.
  When telephone directory data are transferred, directories on the transmitter and receiver can be different. However, the contents received by the receiver will be stored in the open directory. For example, if data transfer is established between file TEL1 in the transmitter and file TEL3 in the receiver, then the contents of TEL1 will be sent to and stored in TEL3.
- Turn off the secret function on both the transmitter and the receiver before mode transfer.
- If the amount of memory available on the receiver at the time of transfer is insufficient, data transfer is not possible. The message "MEMORY FULL" appears. Delete any unnecessary data, verify whether the available memory is sufficient, and repeat the data transfer procedure.

Transferring backup data

All the contents of the Organizer are transferred. During backup data transfer, data stored on the receiver are deleted. Proceed with caution. (Backup data transfer is only possible between identical products.)

1. Select the data transfer function on the receiver and set it in the receive mode for backup data transfer.

   [SHIFT] [OPTION]
   [SHIFT] 2

   ```
   UNIT TO UNIT
   BACKUP
   RECEIVING
   MODE
   ```

2. Select the data transfer function on the transmitter and perform backup data transfer.

   [SHIFT] [OPTION] [SHIFT] 1 Y

Verifying data

It is possible to verify data by mode or by data item. If any discrepancies are found, the message "VERIFY ERROR" is displayed.
Verify data in the SCHEDULE mode.

1. Select the mode on the transmitter and the receiver.

   [SCHEDULE] [C·CE] (Transmitter)
   [SCHEDULE] (Receiver)

2. Set the receiver in the verify mode.

   [SHIFT] [OPTION] 3

   ```
   UNIT TO UNIT

   -VERIFYING-
   ```

3. Select the data transfer function on the transmitter.

   [SHIFT] [OPTION]

Note: To verify one data item, display the data item to be verified and press [SHIFT] [OPTION] .

4. Perform verification.

   1

10-2. Transferring data with a ZQ-5000 or IQ series Organizer

Telephone directory data, schedule data, and memo data can be transferred. Data can be transferred and verified by mode and by data item.

Note: When mode transfer is carried out in the telephone directory mode, all listings in the directory will be transferred. (In this case, the directory name is transferred at the same time.)

Transferring data by mode and by data item

Transfer the "ABC BANK" memo data stored in the Organizer.

1. Recall the data in the transmitter to be transferred.

   [MEMO] [∨]

   Note: To perform mode transfer, select the mode by pressing the mode key, and then press [C·CE] . It is not necessary to display the data.

2. Select the data transfer function on the receiver, and set the receiver in the receive mode.

3. Select the data transfer function on the transmitter and perform data transfer.

   [SHIFT] [OPTION] 1

Note: Follow the same steps to transfer data from a ZQ-5000 or IQ series Organizer.

Verification

Follow the steps explained in "Transferring data between ZQ-2000/2200/2250 Organizers" above.

10-3. Transferring data with an EL series Organizer (including Auto Dialer)

Telephone directory data and schedule data can be transferred. (For the Auto Dialer only the telephone directory data can be transferred.)
Data can be transferred by mode and by data item.
When transferring data with an EL series Organizer, the following restrictions apply:

* When transferring data to an EL series Organizer:
  Transferred data are added to the data previously stored.
  Data are transferred in the same mode and directory.
  If the transferred data item exceeds the maximum number of characters that can be entered into the EL series Organizer as one data item, excess characters are deleted.
  Characters and symbols that cannot be displayed on the EL series Organizer are replaced by spaces. If all the columns that can be displayed are replaced by spaces, the corresponding data item is not stored.
  All received letters are converted to capital letters.
  If the secret function is turned on in the Organizer, only non-secret data are transferred.
* When transferring data from an EL series Organizer:
  The received data are added to the data previously stored.
  When receiving non-English characters, all characters are converted to small letters.
  If the secret function is turned on in the EL series Organizer, only non-secret data are transferred.

Transferring data to an EL series Organizer

Transfer all TEL1 data in the Organizer to TEL1 in the EL Series Organizer.

1. Set the receiver in the receive mode.

2. Select the mode on the transmitter.

   [TEL]

   Since telephone directory data is being transferred, select the file.

3. Select the data transfer function on the transmitter.

   [SHIFT] [OPTION]

   Note: To transfer one data item, display the data item to be transferred and press [SHIFT] [OPTION] .

4. Perform data transfer.

   1

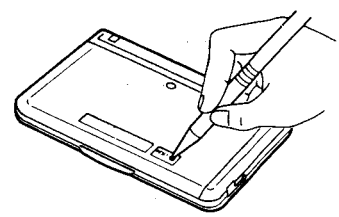
* If the amount of memory available in the receiver at the time of data transfer is insufficient, an error message appears. Delete any unnecessary data, verify that there is sufficient memory available, and repeat the procedure.

Transferring data from an EL series Organizer

1. Select the mode on the receiver.
2. Select the data transfer function on the receiver, and set the receiver in the receive mode.
3. Perform data transfer from the transmitter.

11. When trouble occurs

An impact or a strong external electrical field may leave none of the keys operational. Press the RESET switch on the back of the Organizer.



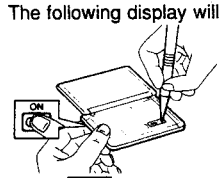
The impact or external electrical field may erase some or all of the Organizer's memory.
Press the RESET switch with the tip of a ball-point pen or similar object, but not anything breakable (like a pencil point or a needle).

All RESET operation

If a problem occurs after replacing the batteries, or if the Organizer does not function properly even after the above RESET operation, perform the following:

1. While holding [ON] , press the RESET switch on the back. Release the RESET switch and then release [ON] .

   The following display will appear.




```
DATA
ALL CLEAR
OK (Y/N) ?
```

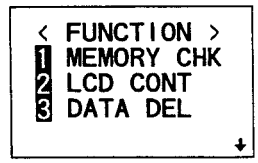
2. Press [N] .
   Returns to the initial display.

Caution: Do not press [Y] in step 2. Pressing [Y] will delete all data and reset the clock.

12. Contrast adjustment

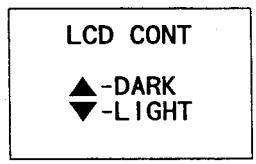
Adjust the display contrast to make the display easier to read.

1. Press [SHIFT] [FUNCTION] .



2. Select "2 LCD CONT".

   2



3. Press [▲] or [▼] to darken or lighten the display as required. The amount of contrast will change continuously when either [▲] or [▼] is held.
4. After adjusting the contrast, press [C·CE] .

13. Turning the "beep" on and off

While "♪" is displayed, a "beep" will sound when a key is pressed. To turn the "beep" on and off, press [SHIFT] [♪] . The "beep" will not sound after "♪" goes off. To turn the "beep" back on, repeat the process.

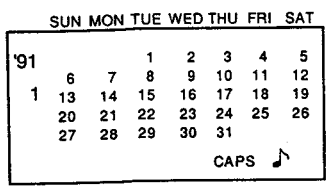
14. Difference between the ZQ-2000, ZQ-2200 and ZQ-2250

1. The parts listed in the table below are different from different models.

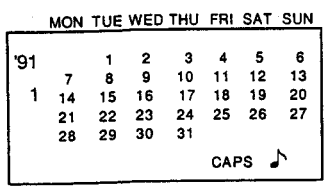
Different part \ Model	Destination	ZQ-2200 U.S.A.	ZQ-2200 Canada	ZQ-2200 Others	ZQ-2000 U.S.A.	ZQ-2000 Canada	ZQ-2000 Others	ZQ-2250
Display film		Ⓐ type			Ⓑ type			Ⓒ type
Operation label (With display of origin)		Ⓐ type	Ⓑ type		Ⓒ type	Ⓓ type		Ⓔ type

- The display film is available in 3 types: Ⓐ ~ Ⓒ.
- The operation label is available in 5 types: Ⓐ ~ Ⓔ.
- Display film calendar

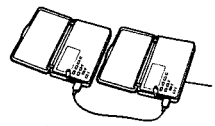
  Ⓐ, Ⓑ type (The left end is Sunday.)



Ⓒ type (The left end is Monday.)

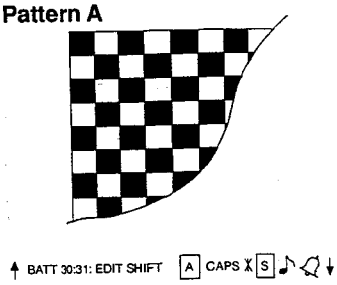


15. Diag function check

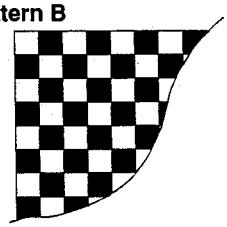
	Item	Operation	Display	Check content
1	Initial setting	While pressing [ON] key, press [RESET] switch.	DATA ALL CLEAR OK (Y/N)?	
		Press [Y] key.	DATA ALL CLEARED! ⇓ * TEL1 * NAME?	
2	Initializing diag function	When pressing [ON] and [9] keys, press [RESET] switch.	[1] CHK [2] AGING	
3	Function selection and display check	Press [1]. Press [ENTER]. Press [ENTER]. Press [ENTER].	Pattern A Pattern B Pattern C Pattern D	Check the display for defects, blurs, leaks, and other abnormalities.
4	Key check	Press [ENTER]. (Note 1)	KEY CHK = = _ =	
5	Key input check	Press all the keys (59 keys) except for [ENTER] key.	KEY CHK	
6	Key check end	Press [ENTER] key.	KEY CHK OK	Must be "OK." (Note 2)
7	RAM check (Automatic check)	Press [ENTER] key. Check time: ZQ-2200/2250 → About 17sec ZQ-2000 ——→ About 11sec	KEY CHK OK RAM 32K OK	Must be "OK." (Note 3) ZQ-2200, 2250 → 32K ZQ-2000 ——→ 16K
8	Communication check	Connect the set Ⓐ (mother unit). Set the mother unit to the check mode. → Press [C•CE]  Set Ⓐ (mother unit)	(Mother unit display) 4PIN CHK	
	(Automatic check)	Press [ENTER] key.	KEY CHK OK RAM 32K OK 4 PIN CHK OK	Must be "OK."
9	Diag end	Remove the set Ⓐ. (Disconnect the 4-pin connector.) Press [ENTER] key.	DATA ALL CLEARED ⇓ * TEL1 * NAME?	
11	Contrast check Function selection	Press [SHIFT] and [FUNCTION] keys. Enter [2]. Keep pressing [▲] key for about 3 sec. Keep pressing [▼] key for about 3 sec.	<FUNCTION> [1] MEMORY CHK [2] LCD CONT [3] DATA DEL LCDCONT ▲–DARK ▼–LIGHT	
10	Calendar check (Perform prior to contrast check.)	Press [CALENDAR] key.	Pattern E	Check that January 1, 91 is "TUE."

ZQ-2250

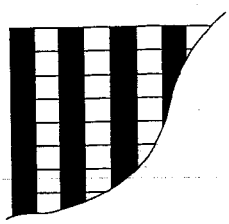
Pattern A



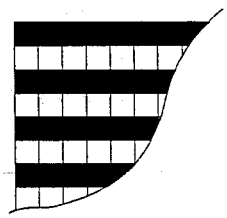
Pattern B



Pattern C



Pattern D



(All symbols are lighted.)

Pattern E

SUN	MON	TUE	WED	THU	FRI	SAT
'91			1	2	3	4	5
	6	7	8	9	10	11	12
1	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31		

CAPS

ZQ-2200/2000

MON	TUE	WED	THU	FRI	SAT	SUN
'91		1	2	3	4	5	6
	7	8	9	10	11	12	13
1	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			

CAPS

ZQ-2250

Note 1: When pressed 2 times or more, "KEY CHK NG" is displayed and operation is stopped.

Note 2: When check program is stopped by mis-operation, press SHIFT and ON C/CE keys to reset to state "2."

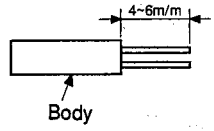
Note 3: When check program is stopped by mis-operation, press SHIFT and ON C/CE keys to reset to state "2."

16. Note for servicing

1. PWB unit

① Crystal oscillator

- Lead cut

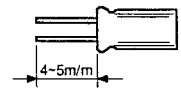


* When installing the PWB unit, the dimensions must meet the specification of the parts arrangement.

- Soldering
  Install so that the part is in parallel with the soldering pad and that it is in close contact with the PWB.
  When soldering, be careful not to allow PWB contact section to extend out from the crystal oscillator spacer.

② Electrolytic capacitor (22μF)

- Lead cut

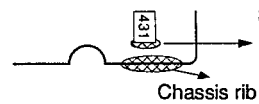


* When installing the PWB unit, the dimensions must meet the specifications of the parts arrangement.

- Soldering
  Install so that the part is in parallel with the soldering pad and that it is in close contact with PWB. When installing, be careful to the polarities.

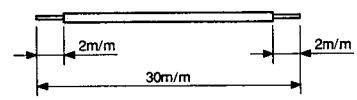
③ Resistor (430 Ω) soldering

Since the attachment pad is not the standard pad, be sure to solder correctly.

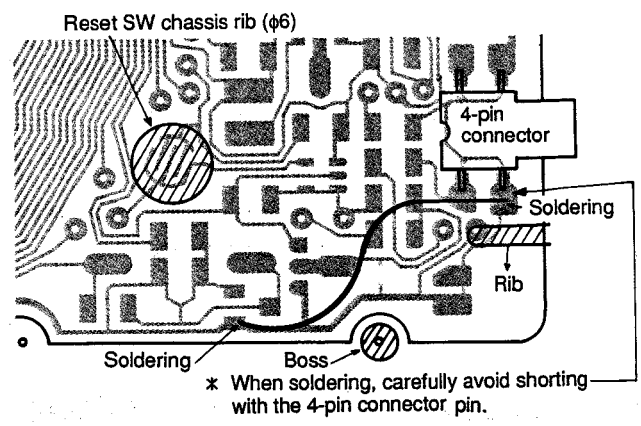


④ Jumper wire

- Cut as shown below:

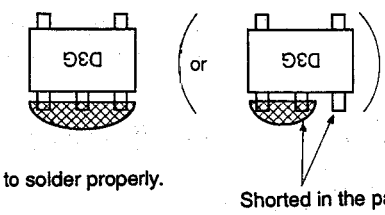


- Install as shown below to protect the chassis rib from being interfered and to cope with buzzer lead soldering.

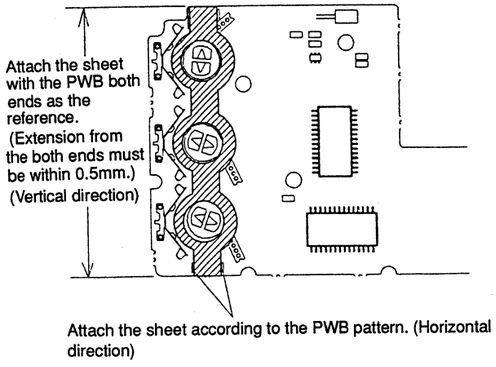


⑤ RB471E soldering short (for old PWB only)

Short the RB471E by soldering the 3-pin side as shown below:

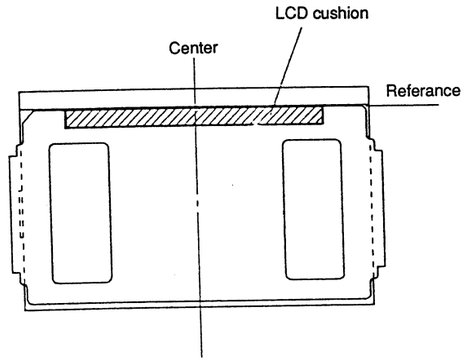


⑥ Battery insulation sheet attachment reference

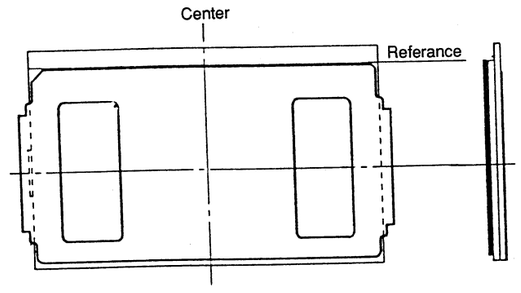

Attach the sheet with the PWB both ends as the reference.
(Extension from the both ends must be within 0.5mm.)
(Vertical direction)
Attach the sheet according to the PWB pattern. (Horizontal direction)

2. LCD unit

① LCD cushion attachment reference

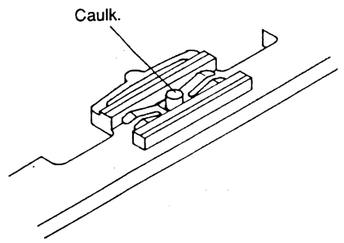


② LCD fixing sheet attachment reference

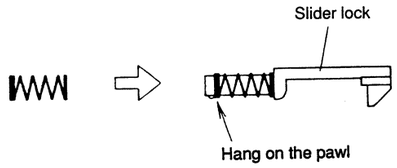


3. Battery housing unit

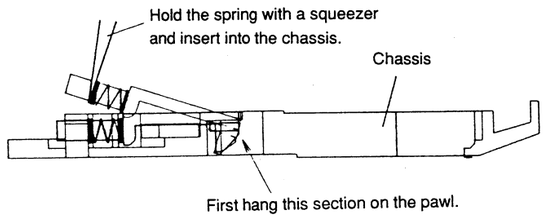
① After attaching the contact to the slider, caulk the slider rib. The contact must be slightly moved after caulking.



② Attach the slider lock spring to the slider lock and hang it on the pawl securely.

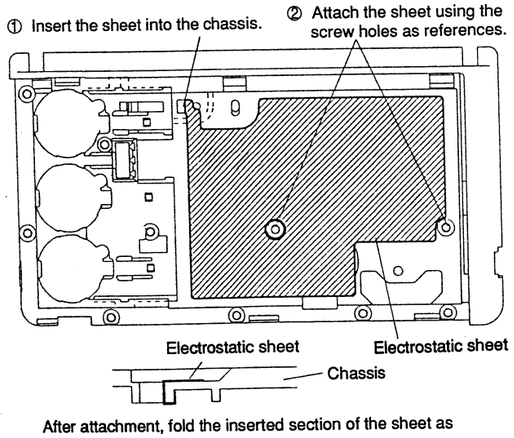


③ Slider lock attachment



4. Chassis

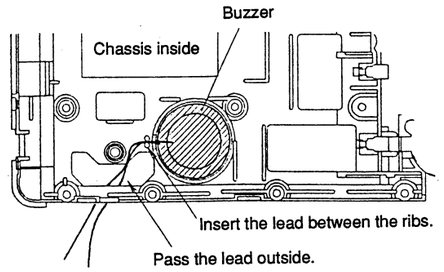
① Electrostatic sheet attachment reference


① Insert the sheet into the chassis.
② Attach the sheet using the screw holes as references.
Electrostatic sheet
Electrostatic sheet
Chassis

After attachment, fold the inserted section of the sheet as shown above.

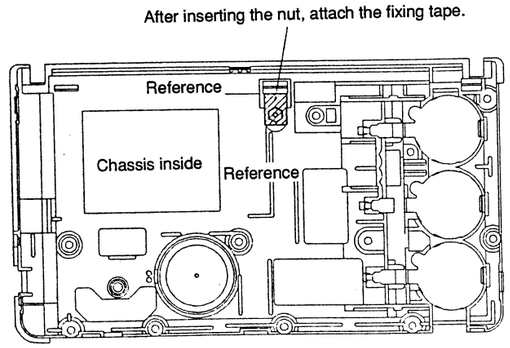
② Buzzer attachment direction

Attach the buzzer as shown below:



- As shown above, pass the buzzer lead outside from the chassis hole. After tighten the chassis with screws, solder the lead.
- When soldering the buzzer lead to the PWB, be careful not to melt the chassis with the soldering iron.
  (For soldering position, see the parts arrangement.)

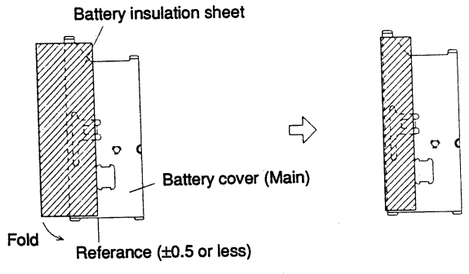
③ Nut attachment and nut fixing tape attachment reference



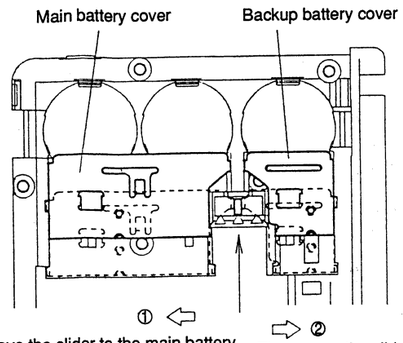
5. Others

① Attach the display film so that it may not cover the cabinet frame.

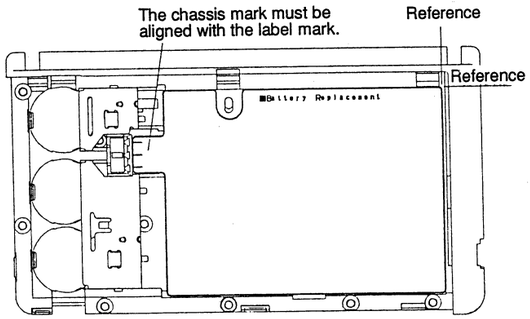
② Battery cover insulation sheet attachment reference



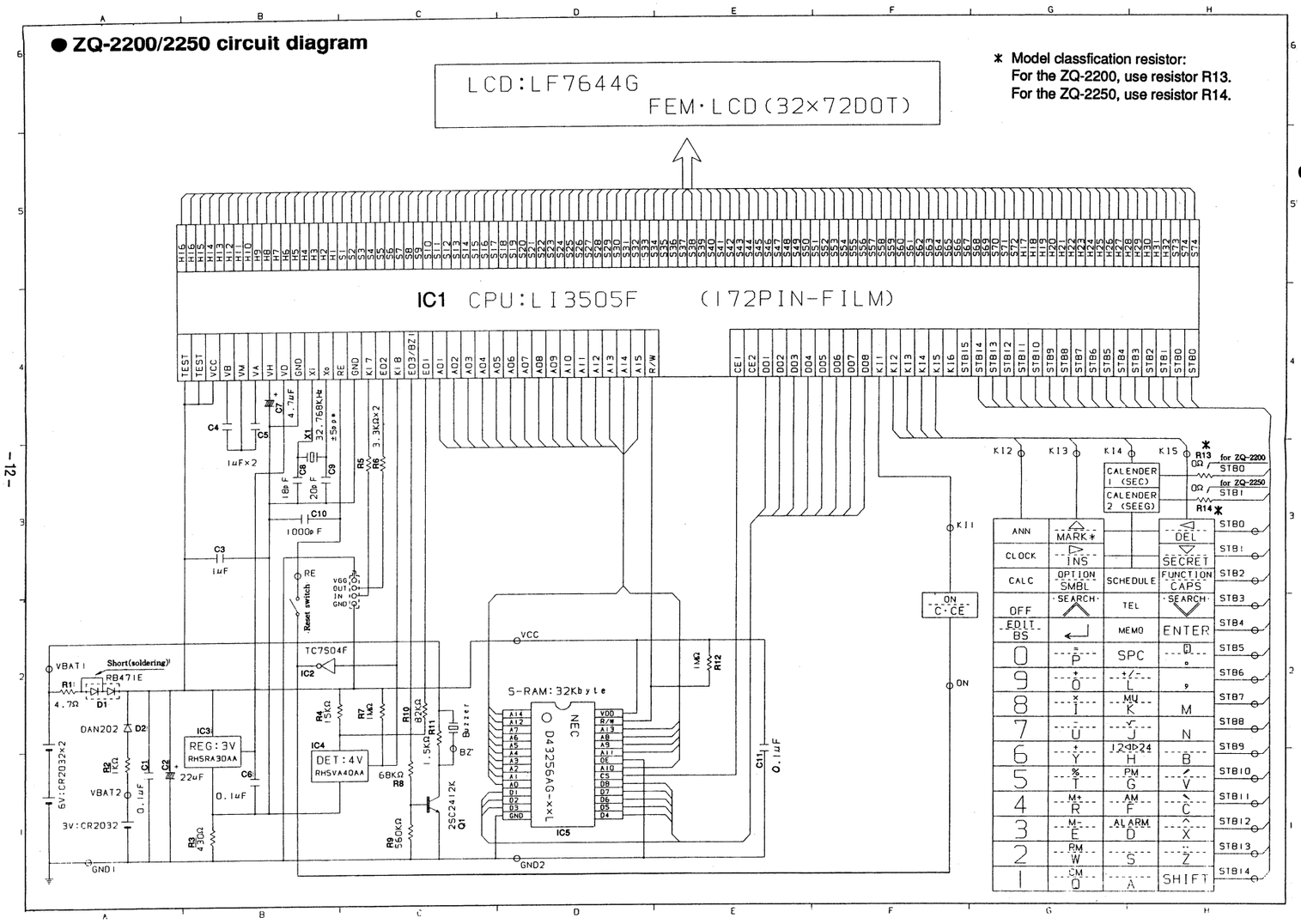
③ Battery cover attachment


Main battery cover
Backup battery cover
① ⇦
⇨ ②
Move the slider to the main battery cover side, and attach the main battery cover.
Then move the slider to the backup battery cover side, and attach the backup battery cover.

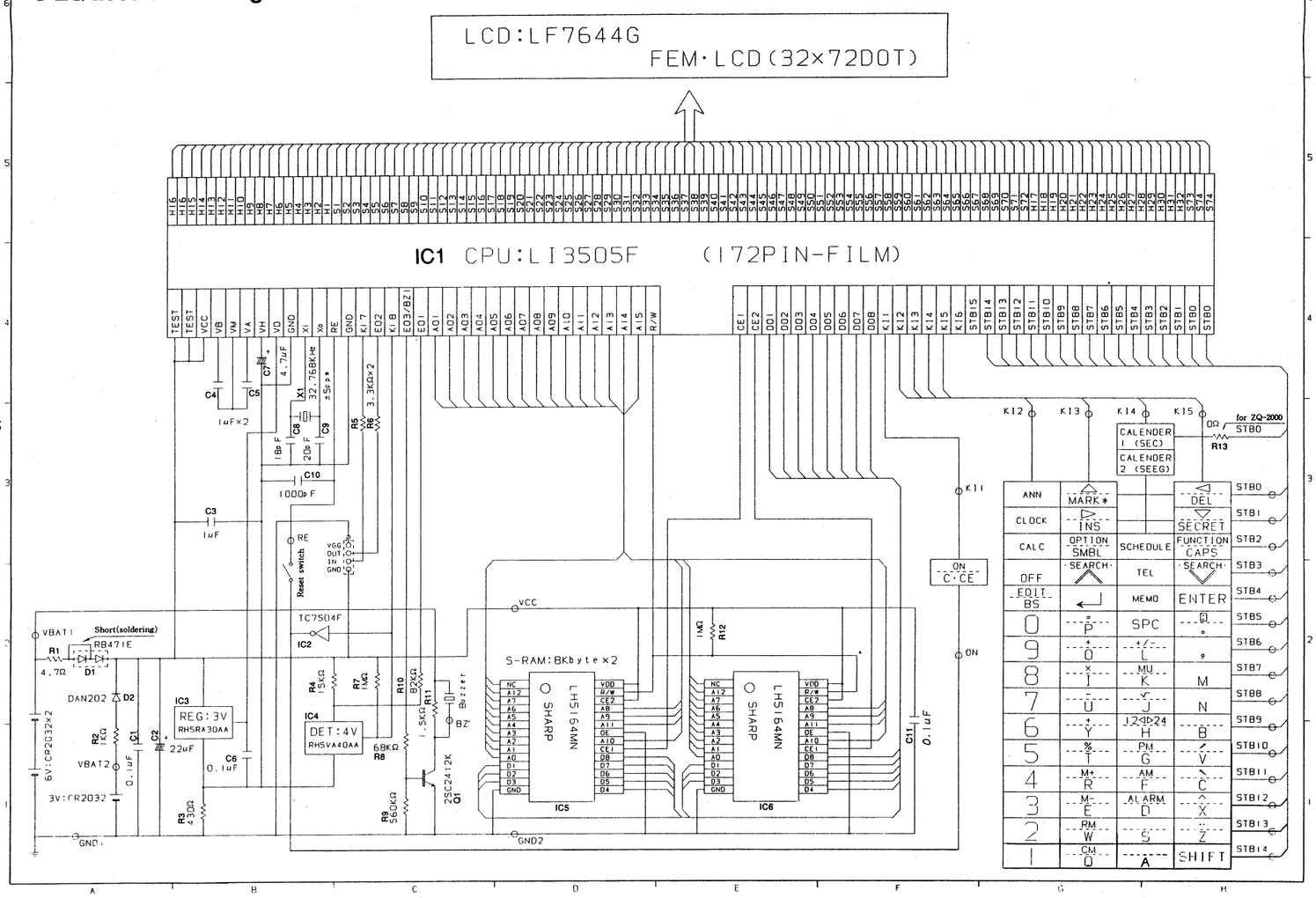
④ Battery operation label attachment reference
Attach the battery operation label so that it may not cover the frame or may not tilt.



● ZQ-2200/2250 circuit diagram

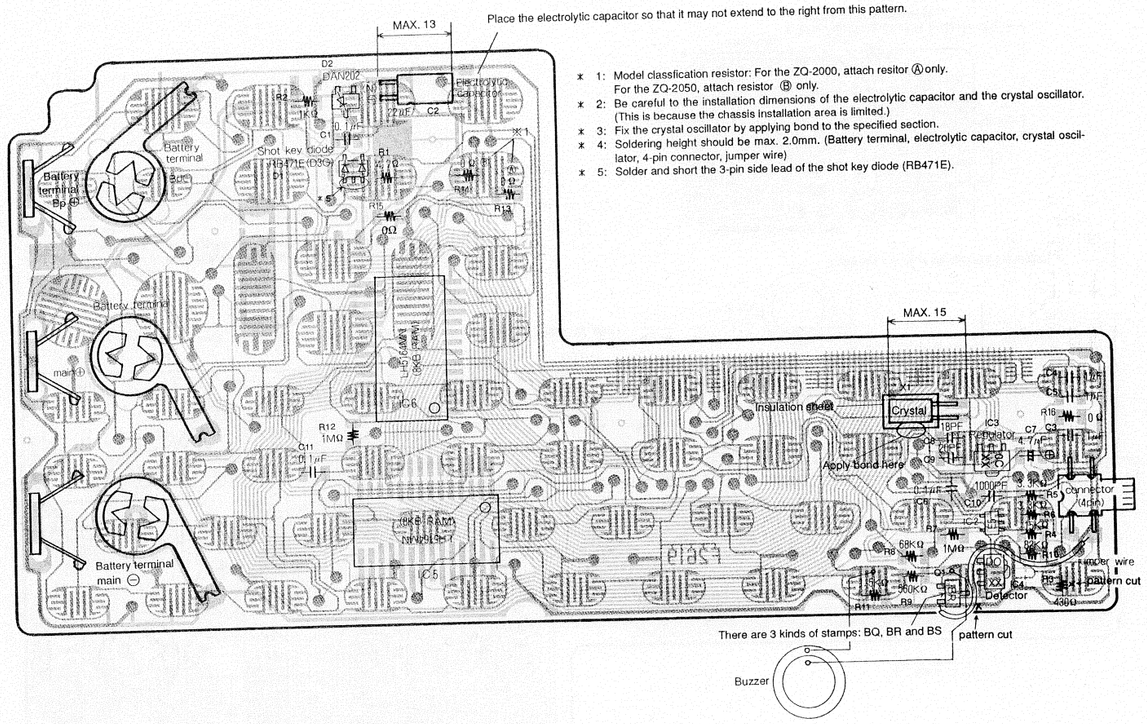


● ZQ-2000 circuit diagram



● ZQ-2000 Old PWB Parts signals arrangement

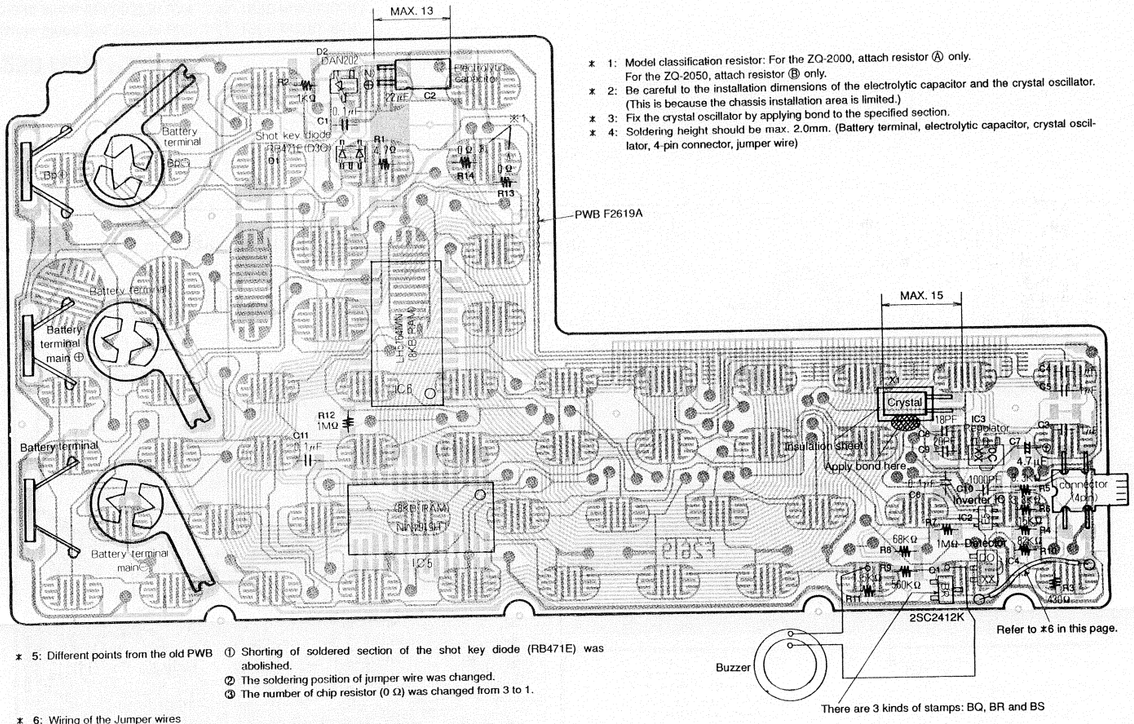
(Applicable till the 2000th unit, July, 1990 production.)



* 1: Model classfication resistor: For the ZQ-2000, attach resitor Ⓐ only.
For the ZQ-2050, attach resistor Ⓑ only.
* 2: Be careful to the installation dimensions of the electrolytic capacitor and the crystal oscillator. (This is because the chassis installation area is limited.)
* 3: Fix the crystal oscillator by applying bond to the specified section.
* 4: Soldering height should be max. 2.0mm. (Battery terminal, electrolytic capacitor, crystal oscillator, 4-pin connector, jumper wire)
* 5: Solder and short the 3-pin side lead of the shot key diode (RB471E).

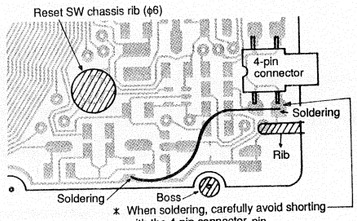
● ZQ-2000 New PWB Parts signals arrangement

(Applicable since the 2001th unit, July, 1990 production.)



* 5: Different points from the old PWB
① Shorting of soldered section of the shot key diode (RB471E) was abolished.
② The soldering position of jumper wire was changed.
③ The number of chip resistor (0 Ω) was changed from 3 to 1.

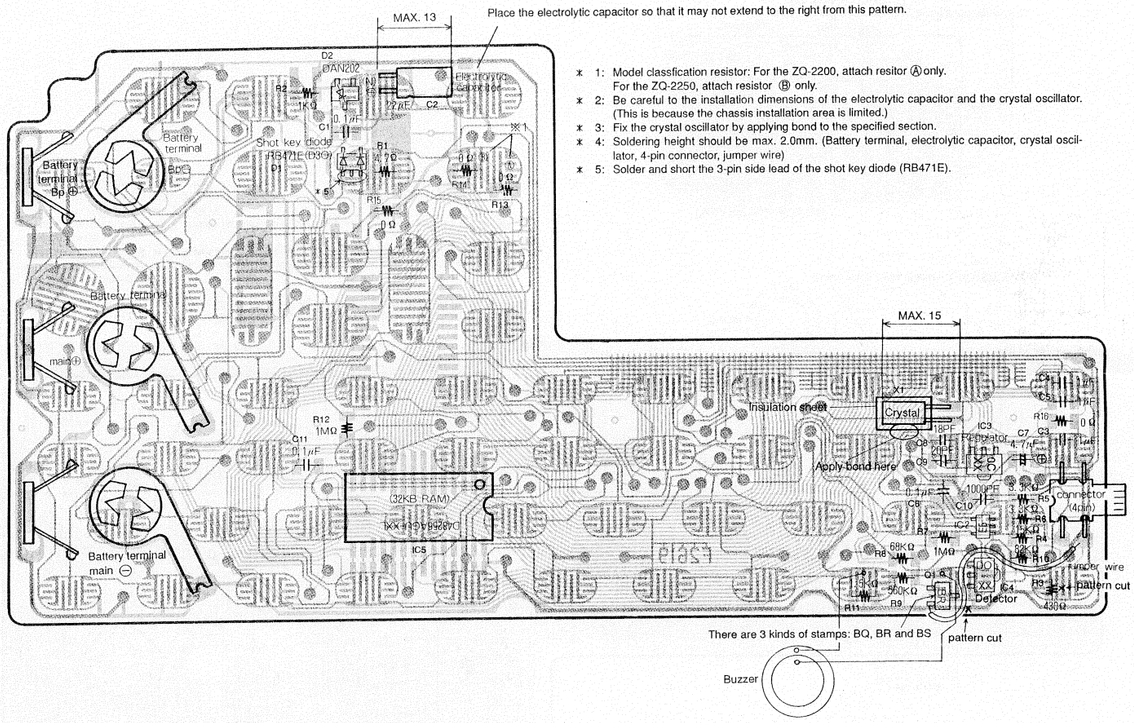
* 6: Wiring of the Jumper wires
① Solder soldering pad Ⓐ in the chip transistor side as far as possible to facilitate wiring.
② Solder soldering pad Ⓑ in the lower side as far as possible to prevent against interference with the chassis rib.
③ Wiring from soldering pad Ⓐ should be performed vertically along the detector IC to prevent against interference with the chassis rib.
④ Wiring from soldering pad Ⓑ should be performed horizontally from the pad to prevent agains interference with the chassis rib.



* When soldering, carefully avoid shorting with the 4-pin connector pin.

● ZQ-2200/2250 Old PWB

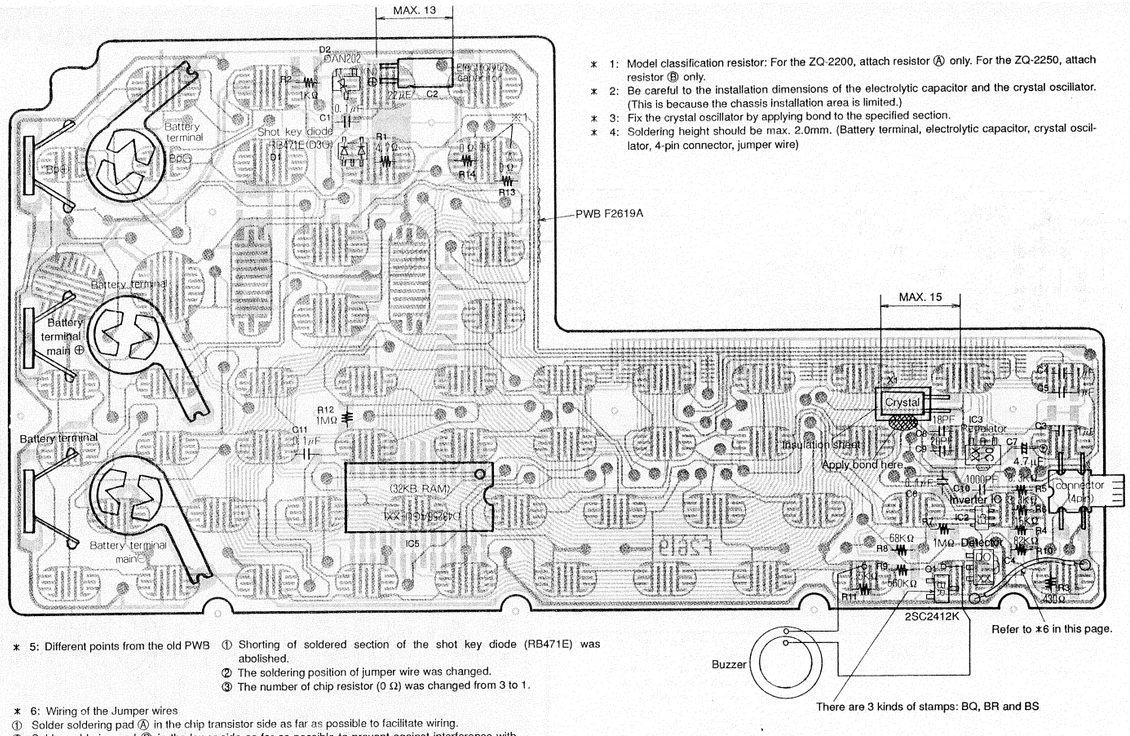
(ZQ-2200: Applicable till the 1880th unit, July, 1990 production.
ZQ-2250: Applicable till the 9836th unit, July, 1990 production.)



⁎ 1: Model classfication resistor: For the ZQ-2200, attach resitor Ⓐ only.
For the ZQ-2250, attach resistor Ⓑ only.
⁎ 2: Be careful to the installation dimensions of the electrolytic capacitor and the crystal oscillator. (This is because the chassis installation area is limited.)
⁎ 3: Fix the crystal oscillator by applying bond to the specified section.
⁎ 4: Soldering height should be max. 2.0mm. (Battery terminal, electrolytic capacitor, crystal oscillator, 4-pin connector, jumper wire)
⁎ 5: Solder and short the 3-pin side lead of the shot key diode (RB471E).

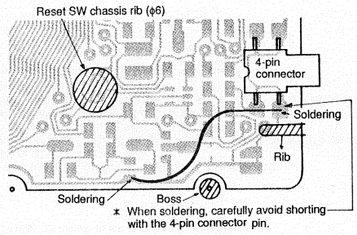
● ZQ-2200/2250 New PWB

(ZQ-2200: Applicable since the 1881th unit, July, 1990 production.
ZQ-2250: Applicable since the 9837th unit, July, 1990 production.)



⁎ 5: Different points from the old PWB
① Shorting of soldered section of the shot key diode (RB471E) was abolished.
② The soldering position of jumper wire was changed.
③ The number of chip resistor (0 Ω) was changed from 3 to 1.

⁎ 6: Wiring of the Jumper wires
① Solder soldering pad Ⓐ in the chip transistor side as far as possible to facilitate wiring.
② Solder soldering pad Ⓑ in the lower side as far as possible to prevent against interference with the chassis rib.
③ Wiring from soldering pad Ⓐ should be performed vertically along the detector IC to prevent against interference with the chassis rib.
④ Wiring from soldering pad Ⓑ should be performed horizontally from the pad to prevent against interference with the chassis rib.



19. Parts list & guide

1 PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	ZQ 2000	ZQ 2200	ZQ 2250
1	PZETL1717CCZZ	AA		C	Insulation sheet(for crystal)	○	○	○
2	PZETL1814CCZZ	AB	N	C	Insulation sheet	○	○	○
3	QCNCM1416CC0D	AE		C	Connector (4pin)	○	○	○
4	QTANZ1583CC06	AC	N	C	Battery terminal ⊖	○	○	○
5	QTANZ1588CCZZ	AB		C	Battery terminal ⊕	○	○	○
6	RC-CZ1091CCZZ	AB		C	Capacitor (16WV 1μF) [C3,4,5]	○	○	○
7	RC-EZ226BCC0J	AD		C	Capacitor (6.3WV 22μF) [C2]	○	○	○
8	RC-SZ1051CCZZ	AA	N	C	Capacitor (4.7μF) [C7]	○	○	○
9	RCRSP1036CCZZ	AH		B	Crystal (32.768KHz) [X1]	○	○	○
10	RH-DZ1013CCZZ	AE		B	Diode (RB471E) [D1]	○	○	○
11	VCCCTQ1HH180J	AA	N	C	Capacitor (50WV 18PF) [C8]	○	○	○
12	VCCCTQ1HH200J	AA	N	C	Capacitor (50WV 20PF) [C9]	○	○	○
13	VCKYTQ1EF104Z	AA		C	Capacitor (25WV 0.10μF) [C1,6,11]	○	○	○
14	VCKYTQ1HB102K	AA	N	C	Capacitor (50WV 1000PF) [C10]	○	○	○
15	VHDDAN202K/-1	AB		B	Diode (DAN202K) [D2]	○	○	○
16	VHiD43256AGU1	AZ	N	B	IC [IC5]		○	○
17	VHiLH5164MN-1	AS		B	IC (LH5164MN) [IC5,6]	○		
18	VHiRH5RA30A-1	AE	N	B	IC (RH5RA30A) [IC3]	○	○	○
19	VHiRH5VA40A-1	AE	N	B	IC (RH5VA40A) [IC4]	○	○	○
20	VHiTC7S04F/-1	AC		B	IC (TC7S04F) [IC2]	○	○	○
21	VRS-TP2BD000J	AA		C	Resistor (1/8W 0Ω ±5%) [R13…for ZQ-2000,2200, R14…for ZQ-2250,R15・16…for old PWB)	○	○	○
22	VRS-TP2BD102J	AA		C	Resistor (1/8W 1KΩ ±5%) [R2]	○	○	○
23	VRS-TP2BD105J	AA		C	Resistor (1/8W 1.0MΩ ±5%) [R7,12]	○	○	○
24	VRS-TP2BD152J	AA		C	Resistor (1/8W 1.5KΩ ±5%) [R11]	○	○	○
25	VRS-TP2BD153G	AA		C	Resistor (1/8W 15KΩ ±2%) [R4]	○	○	○
26	VRS-TP2BD332J	AA		C	Resistor (1/8W 3.3KΩ ±5%) [R5,6]	○	○	○
27	VRS-TP2BD4R7J	AA		C	Resistor (1/8W 4.7Ω ±5%) [R1]	○	○	○
28	VRS-TP2BD431J	AA		C	Resistor (1/8W 430Ω ±5%) [R3]	○	○	○
29	VRS-TP2BD564J	AA		C	Resistor (1/8W 560KΩ ±5%) [R9]	○	○	○
30	VRS-TP2BD683J	AA		C	Resistor (1/8W 68KΩ ±5%) [R8]	○	○	○
31	VRS-TP2BD823G	AA	N	C	Resistor (1/8W 82KΩ ±2%) [R10]	○	○	○
32	VS2SC2412K/-1	AB		B	Transistor (2SC2412K) [Q1]	○	○	

2 Packing material & Accessories

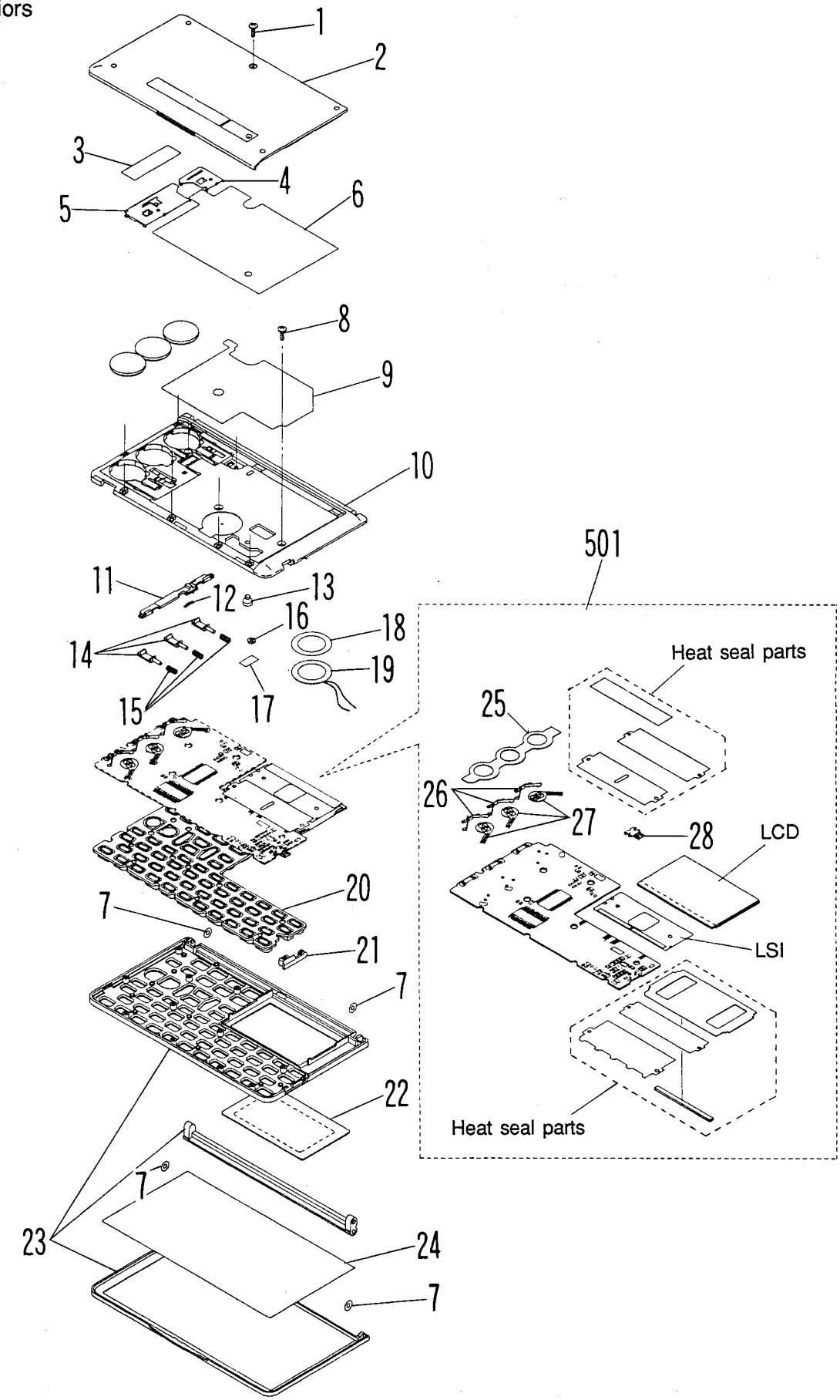
NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	ZQ 2000	ZQ 2200	ZQ 2250
1	TiNSE5397CCZZ	AH	N	D	Instruction book(E) (for U.S.A)	○	○	
	TiNSE5408CCZZ	AK	N	D	Instruction book(E) (except for U.S.A.)	○	○	
	TiNSF5409CCZZ	AK	N	D	Instruction book(F) (for Canada)	○	○	
	TiNSG5411CCZZ	AL	N	D	Instruction book(G) (for Germany)			○
	TiNSE5410CCZZ	AE	N	D	Instruction book(E) (except for Germany)			○
2	TCAUK1173CCZZ	AA		D	Caution card	○	○	○
3	TLABZ2807CCZZ	AB		D	Date label(for battery replacement)	○	○	○
4	SPAK-893CCCZZ	AB		D	Vinyl bag (125×230mm)	○	○	○
5	TCADZ1808CCZZ	AA		D	Noise card (for Canada)	○	○	
6	SPAKA830DCCZZ	AB	N	D	Packing cushion for set (for U.S.A,Canada)	○	○	
	SPAKA837DCCZZ	AB	N	D	Packing cushion for set (except for U.S.A,Canada)	○	○	○
7	SPAKC831DCCZZ	AE	N	D	Packing case (for U.S.A.)	○		
	SPAKC834DCCZZ	AF	N	D	Packing case (for Canada)	○		
	SPAKC838DCCZZ	AF	N	D	Packing case (except for U.S.A.,Canada)	○		
	SPAKC844DCCZZ	AD	N	D	Packing case (for U.S.A.)		○	
	SPAKC847DCCZZ	AG	N	D	Packing case (for Canada)		○	
	SPAKC850DCCZZ	AE	N	D	Packing case (except for U.S.A.,Canada)		○	
	SPAKC853DCCZZ	AE	N	D	Packing case			○
8	TLABH3063CCZZ	AE	N	D	Operation label (for Canada)	○		
	TLABH3058CCZZ	AE	N	D	Operation label (for Canada)		○	

[redacted]
ZQ-2250

3 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	ZQ 2000	ZQ 2200	ZQ 2250
1	LX-BZ1276CCZZ	AA	N	C	Screw	○	○	○
2	GCABA3011CCZZ	AD	N	D	Bottom cabinet	○	○	○
3	PZETL1832CCZZ	AA	N	C	Battery lid insulation label	○	○	○
4	PFTAB1004CCZZ	AB	N	C	Battery lid(memory)	○	○	○
5	PFTAB1005CCZZ	AC		C	Battery lid(main)	○	○	○
6	TLABZ3024CCZZ	AD	N	D	Battery replacement label	○	○	○
7	PSPAP1379CCZZ	AA	N	C	Spacer	○	○	○
8	LX-BZ1193CCZZ	AA		C	Screw	○	○	○
9	PSLDC1601CCZZ	AD	N	C	Electrostatic sheet	○	○	○
10	LCHSS1224CCZZ	AD	N	C	Chassis	○	○	○
11	MSLiP1051CCZZ	AB		C	Slider	○	○	○
12	QCNTM1056CC02	AB		C	Contact	○	○	○
13	PGUMM1693CCZZ	AA		B	Reset rubber	○	○	○
14	JKNBZ2095CCZZ	AA		C	Slider lock	○	○	○
15	MSPRC1366CCZZ	AA		C	Slider lock spring	○	○	○
16	XNESD20-16000	AA		C	Nut (2mm)	○	○	○
17	PZETL1832CCZZ	AA	N	C	Insulation sheet	○	○	○
18	PTPEH1213CCZZ	AB		C	Adhesive tape (for buzzer)	○	○	○
19	RALMB1030CCZZ	AD		B	Buzzer (EFB-S49C02P)	○	○	○
20	PGUMM1713CCZZ	AK	N	B	Key rubber	○	○	○
21	GFTAS1356CCZZ	AC	N	D	Connector lid	○	○	○
22	PSHEZ1503CC02	AE	N	D	Display film	○		
	PSHEZ1503CCZZ	AE	N	D	Display film		○	
	PSHEZ1503CC01	AE	N	D	Display film			○
23	DUNTG459DCCZZ	AR	N	D	Top cabinet unit (Includes No.7)	○		
	DUNTG453DCCZZ	AR	N	D	Top cabinet unit (Includes No.7)		○	○
24	TLABH3021CCZZ	AF	N	D	Operation label	○		
	TLABH3018CCZZ	AF	N	D	Operation label		○	
	TLABH3064CCZZ	AF	N	D	Operation label (for Germany)			○
	TLABH3020CCZZ	AF	N	D	Operation label (except for Germany)			○
25	PZETL1814CCZZ	AB	N	C	Insulation sheet	○	○	○
26	QTANZ1588CCZZ	AB		C	Battery terminal ⊕	○	○	○
27	QTANZ1583CC06	AC	N	C	Battery terminal ⊖	○	○	○
28	QCNCM1416CC0D	AE		C	Connector (4pin)	○	○	○
501	DUNTK460DCCZZ	BK	N	E	PWB unit (with LCD) (Includes No. 25 ~ 28)	○		
	DUNTK441DCCZZ	BN	N	E	PWB unit (with LCD) (Includes No. 25 ~ 28)		○	
	DUNTK456DCCZZ	BM	N	E	PWB unit (with LCD) (Includes No. 25 ~ 28)			○

1 Exteriors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